

# **Visualization of Money for Children in an Increasingly Cashless Society: A Virtual Education tool**

Presented in partial fulfillment of the requirements for graduation *with research distinction* in Visual Communication Design in the undergraduate colleges of The Ohio State University.

By

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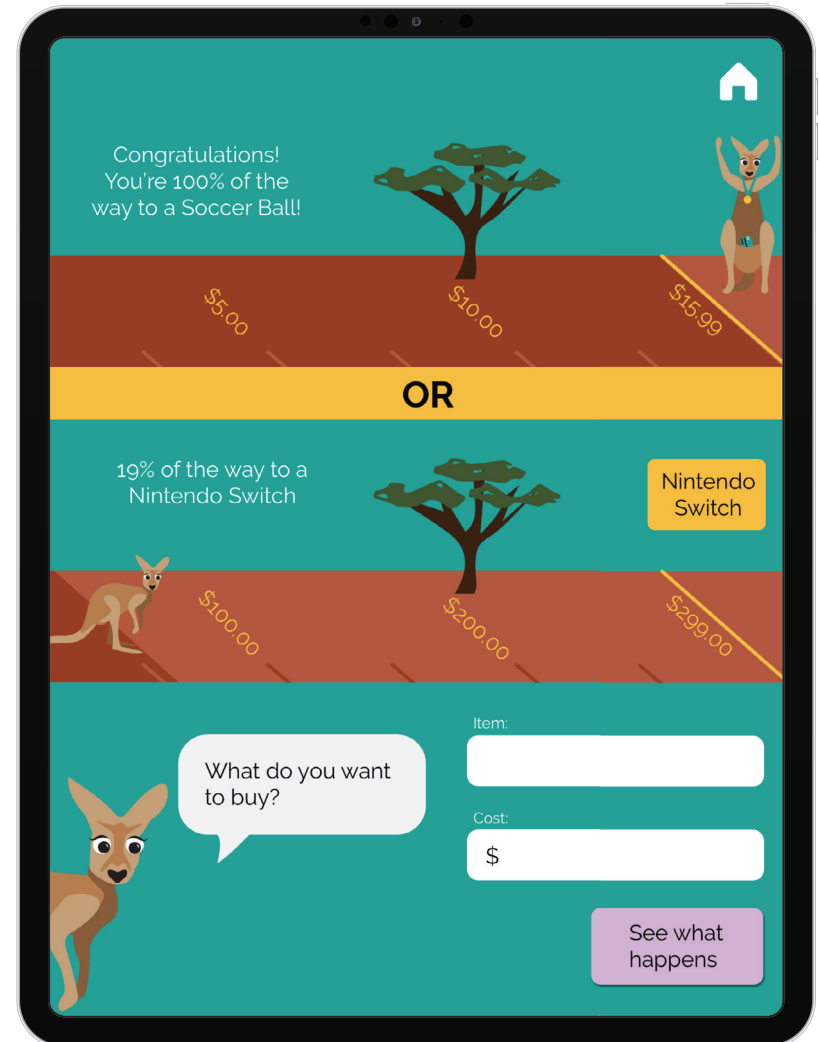
The following is was an early prototype based on preliminary data completed for a one semester (AU19) senior thesis requirement that everyone in the Visual Communication Design major has to complete for graduation.

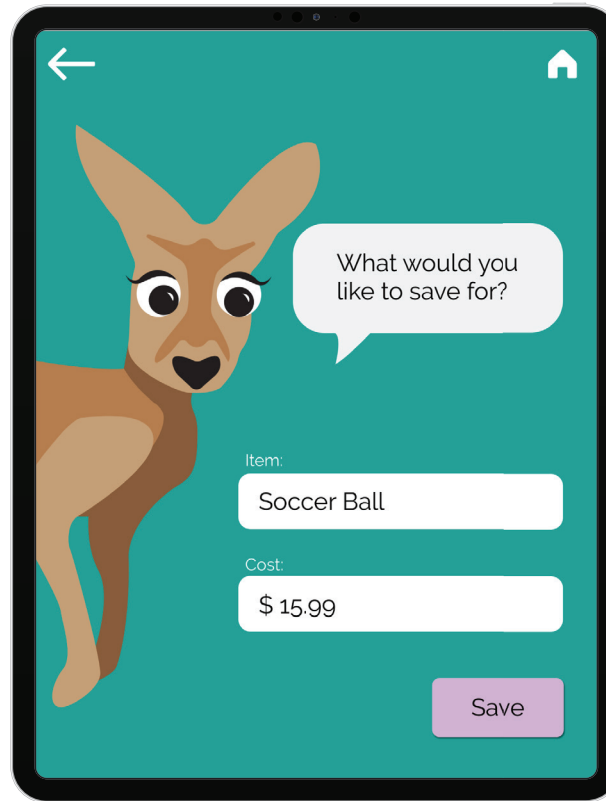
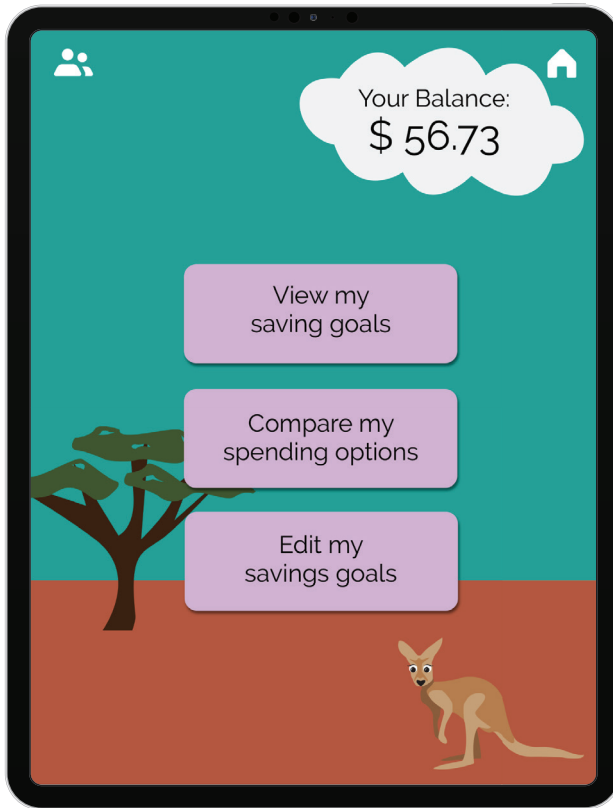
For this research distinction, I am taking it a step farther to dive deeper into the data to figure out what a next generation design would look like.

# fund

putting the fun into saving

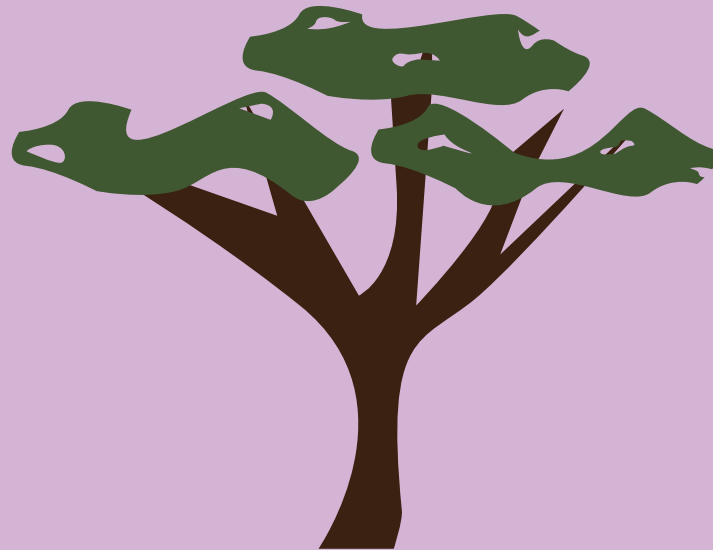
**fund** is an app that will help middle schoolers visualize what their bank account balance represents in terms of their savings goals and will help them make choices about when to spend versus save.





**fund** links to your bank account so you have the ability to set goals and see your progress in real time as Copper, the app's mascot, hops toward the finish line of each goal.

**A look at last semester's research...**



## **Research Methods used...**

**Secondary research** consisting of news articles, mom blogs, and competitive analysis.

**Interviewed** a mom and four kids from the same family to see how their understanding of money and saving changed with age within the same household.

**Parent survey** distributed online (64 participants).

**School survey** distributed to students at two middle schools (229 participants ages 10-13). One school is affluent and the other is a Title 1 school to achieve a very diverse group of students varying in financial status in an effort to see how that affected their understanding of money.

## For this distinction, I am focusing on further analyzing the “School Survey”

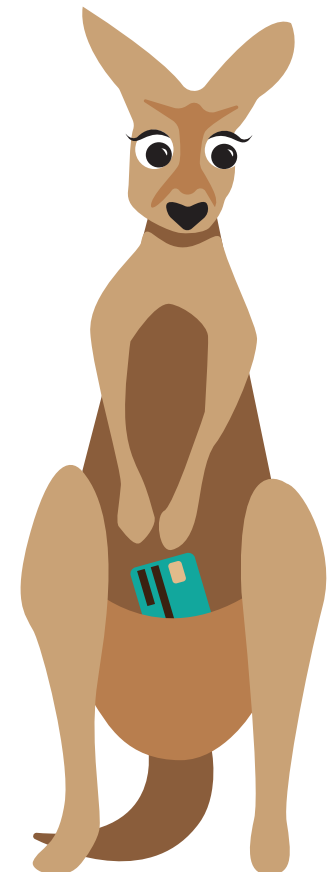
**School survey** distributed to students at two middle schools (229 participants ages 10-13). One school is affluent and the other is a Title 1 school to achieve a very diverse group of students varying in financial status in an effort to see how that affected their understanding of money.

I was very curious to see if the kids who's families had a lot of money understood it better than those who didn't have a lot, or vice versa.



**These questions were distributed online via a Google survey (multiple choice answers appear next to the question when applicable):**

- 1. How old are you?** 8, 9, 10, 11, 12, 13, 14, 15, 16
- 2. What school do you attend?**
- 3. Do you know what a bank is?** Yes/No/Maybe
- 4. Do you know what a bank account is?** Yes/No/Maybe
- 5. Do you know what a credit card is?** Yes/No/Maybe
- 6. Do you know what a debit card is?** Yes/No/Maybe
- 7. What's the difference between a credit card and a debit card?**
- 8. Do you know what an ATM is?** Yes/No/Maybe
- 9. Do you know what a check is?** Yes/No/Maybe
- 10. Do you get paid a weekly allowance?** Yes/No/Sometimes
- 11. What does saving money mean to you?**
- 12. Do you have a piggy bank (or somewhere else you keep your money)?** Yes/No
- 13. Do you have a bank account?** Yes/No/I don't know
- 14. You were just given \$5 for doing a chore, what are you going to do with the money?** Spend it/Save it/Share it/Something else
- 15. You were just given \$40 for your birthday, what are you going to go buy?**
- 16. If you had \$10, would you save all of it or would you use part of it to buy candy and save the rest?** Save all of it/Buy candy and save the rest
- 17. What is the number one thing on your wish list and how much do you think it costs?**
- 18. On your birthday, what gift is your favorite to receive?**  
Cash/An item (toys, clothes, etc.)/A check/A Gift card
- 19. Explain how gift cards work**



## Main take aways last semester...

**99%** of students surveyed reported that they **know what a bank is.**

**66%** reported that they **know what a debit card is.**

**20%** of students reported that they **get paid a weekly allowance.**

**86%** of students surveyed reported that they have a **piggy bank (or somewhere else they keep their money).**

**40%** of students surveyed reported that they **have a bank account.**

**87%** of students surveyed reported that **if they were given \$5 for doing a chore, that they would save it.**

**52%** of students surveyed reported that their **favorite gift to receive on their birthday is cash.**

# Here's a look at my process for further analysis... AKA a lot of spreadsheets, color coding and snuggles from my pup

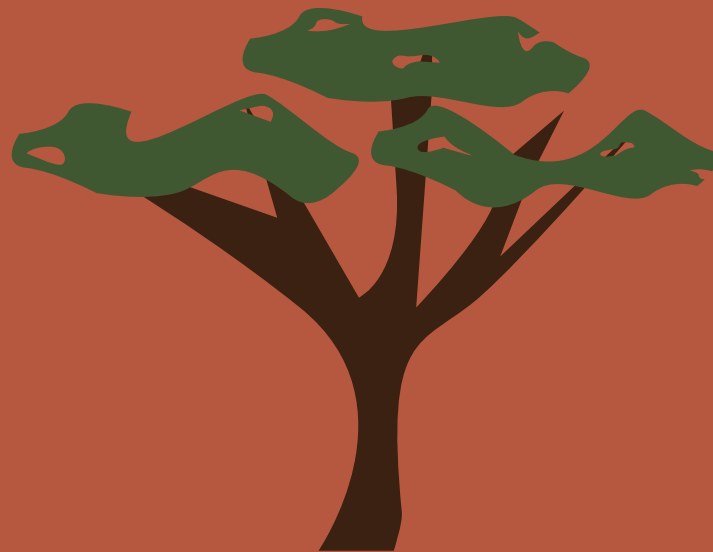


Excel Spreadsheet analysis

Google survey responses

Side-by-side

**“What does saving mean to you?”**



# **“What does saving mean to you?”**

**When analyzing this question, the responses fell within 11 categories:**

- **References “future,” “growing up” or “having responsibility”**
- **References “not using all your money” or not spending it “immediately”/“all at once”**
- **References saving for something you can’t afford yet/want**
- **References storing money/keeping it safe for later**
- **References saving for something “important,” “expensive,” or “special”**
- **References saving for something you “need”**
- **Responses including “don’t know” or “nothing”**
- **References saving for “when you need it” or “for an emergency”**
- **Mention a “goal”**
- **Mention a “budget”**
- **Uncategorized (responses that didn’t share commonalities)**

## “What does saving mean to you?”

When analyzing this question, the responses fell within 11 categories:

- References **“future,” “growing up” or “having responsibility”**— **10.9%** of total students
- References **“not using all your money” or not spending it “immediately”/“all at once”**— **10.9%** of total students
- References saving for something **you can’t afford yet/want**— **12.2%** of total students
- References **storing money/keeping it safe for later**— **8.7%** of total students
- References saving for something **“important,” “expensive,” or “special”**— **12.7%** of total students
- References **saving for something you “need”**— **4.4%** of total students
- Responses including **“don’t know” or “nothing”**— **6.1%** of total students
- References saving for **“when you need it” or “for an emergency”**— **5.7%** of total students
- **Mention a “goal”**— **3%** of total students
- **Mention a “budget”**— **1.3%** of total students
- **Uncategorized** (responses that didn’t share commonalities)— **23%** of total students



# **“What does saving mean to you?”**

## **Breaking down these categories:**

- References **“future,” “growing up” or “having responsibility”— 10.9%** of total students

**This means that 10.9% of students surveyed understand the impact that saving can have on your future.**

# **“What does saving mean to you?”**

## **Breaking down these categories:**

- References **“not using all your money” or not spending it “immediately”/“all at once”— 10.9%** of total students
- References saving for something **you can’t afford yet/want— 12.2%** of total students
- References **storing money/keeping it safe for later— 8.7%** of total students
- References saving for something **“important,” “expensive,” or “special”— 12.7%** of total students

**This means 44.5% of students surveyed have a general understanding of what it means to physically save money.**



# **“What does saving mean to you?”**

## **Breaking down these categories:**

- References **saving for something you “need”**— 4.4% of total students
- References saving for **“when you need it” or “for an emergency”**— 5.7% of total students
- **Mention a “budget”**— 1.3% of total students

**This means 11.4% of students surveyed have an understanding of saving for needs/emergencies over wants.**

# **“What does saving mean to you?”**

**Breaking down these categories:**

- **Mention a “goal”— 3% of total students**

**This means 3% of students surveyed understand the concept of savings goals, showing the value fund could bring to the remaining students.**

# **“What does saving mean to you?”**

## **Breaking down these categories::**

- Responses including **“don’t know” or “nothing”— 6.1%** of total students

**This means 6.1% of students surveyed don’t know what saving means or admitted it means nothing to them.**

# “What does saving mean to you?”

## Breaking down these categories:

- **Uncategorized** (responses that didn't share commonalities)— **23%** of total students

**This means 23% of students surveyed gave an answer that could not be categorized. These answers either were completely unique or simply did not make sense.**

## **“What does saving mean to you?”**

**Five students surveyed specifically mentioned that saving to them meant “college.”**

These students are not even in high school yet, but they understand that college is expensive and that if they don't save for it, they may not be able to attend.

## “What does saving mean to you?”

There were 12 answers that stood out to me because they involved selflessness and things 10-13 year olds should not be worrying about.

- “Saving money is really important to me instead of buying something right away. **Money is a big part of this world now and it has value. Without saving money you might get a repossession and lose your house.**”—age 11, Title 1 school
- “Money to me is **what we use to get goods and services, and it needs to be used carefully.**” —age 11, Title 1 school
- “It means a lot because **I could save the money for my father so I can get a house and stuff.**” —age 11, Title 1 school
- “It helps to be prepared if you ever get into a tight situation or even have debt. **Even if you save a little bit and use some you still might be helping yourself out in the future.**” —age 11, Title 1 school
- “Saving money helps me get what I need or want. **If I save money, I can buy something my mom can’t at the moment. And putting enough money to the side to help buy for college or a car in the future.**”—age 13, Title 1 school

## “What does saving mean to you?”

There were 12 answers that stood out to me because they all involved selflessness and things 10-13 year olds should not be worrying about.

- “Saving money is when you have a goal to buy something and you save your money up to buy it. **Some people start saving money when their 13 for their college debt because in college you have to take out loans and then pay them later.**” —age 11, Title 1 school
- “Saving money means that **if financial problems hits you, you have backup way to redeem yourself.**” —age 11, Title 1 school
- “It means a lot to me because if you want something you can save up for it and get it and **if you save money and you lose your job or something you have money to survive.**” —age 11, Title 1 school
- **“A lot Especially When You Need To Pay Your Bills”** —age 11, Title 1 school
- **“I will never be in debt.”**—age 11, Affluent school
- “It’s important because **I might need to save up for a car or a Christmas gift.**” —age 11, Affluent school
- **“Less student loans”** —age 11, Affluent school

## **“What does saving mean to you?”**

**There were 12 answers that stood out to me because they all involved selflessness and things 10-13 year olds should not be worrying about.**

It is clear that they understand the value of money and the importance of saving it, especially those who attend the Title 1 school. It also speaks to the character of these students since they're so selfless.

Debt, bills and losing your job are not things that 11 year olds have experienced themselves, but they clearly see their parent struggling with these things, and understand that money is the solution.

This is not something I expected to see in this research, middle schoolers understanding of money is much more complex than I realized.



**“What is the number one thing on  
your wish list and how much do you think  
it costs?”**



**“What is the number one thing on your wish list and how much do you think it costs?”**

**When analyzing this question, the responses fell within 9 categories:**

- **N/A Student's item was money**
- **N/A Item not specific enough to check price**
- **N/A No item in answer**
- **In range (Item varies in price and this price is in the range)**
- **Exact (Exact price was given)**
- **Almost (Guess is within 10% of actual price)**
- **Close (Guess is within 25% of actual price)**
- **Wrong (Guess not within 25% of actual price)**
- **Don't know (No price guessed, so cannot compare accuracy)**

**“What is the number one thing on your wish list and how much do you think it costs?”**

**When analyzing this question, the responses fell within 9 categories:**

- **N/A Student's item was money**—**3.5%** of total students
- **N/A Item not specific enough to check price**—**26%** of total students
- **N/A No item in answer**—**11.8%** of total students
- **In range** (Item varies in price and this price is in the range)—**18.8%** of total students
- **Exact** (Exact price was given)— **11.3%** of total students
- **Almost** (Guess is within 10% of actual price)—**2.9%** of total students
- **Close** (Guess is within 25% of actual price)—**3.9%** of total students
- **Wrong** (Guess not within 25% of actual price)—**12.7%** of total students
- **Don't know** (No price guessed, so cannot compare accuracy)— **9.2%** of total students

**“What is the number one thing on your wish list and how much do you think it costs?”**

**Breaking down these categories:**

- **N/A**—Student's item was money...**3.5%** of total students
- **N/A**—Item not specific enough to check price... **26%** of total students
- **N/A**— No item in answer...**11.8%** of total students

**Unfortunately, this means 41.3% of answers were unable to be used to determine if students know what items cost**

**“What is the number one thing on your wish list and how much do you think it costs?”**

**Breaking down these categories:**

- **In range**—Item varies in price and this price is in the range...**18.8%** of total students
- **Exact**—Exact price was given...**11.3%** of total students
- **Almost**—Guess is within 10% of actual price...**2.9%** of total students
- **Close**—Guess is within 25% of actual price...**3.9%** of total students

**This means 36.9 % of answers were within 25% of the actual price of the student's desired item.**

**“What is the number one thing on your wish list and how much do you think it costs?”**

**Breaking down these categories:**

- **Wrong**—Guess not within 25% of actual price...**12.7%** of total students  
- **89.7% of wrong guesses** were too **low**
- **Don't know**—No price guessed, so cannot compare accuracy...**9.2%** of total students

**This means 22% of students surveyed did not know the cost of their desired item or guessed completely wrong.**

# **“What is the number one thing on your wish list and how much do you think it costs?”**

## **A break down of common items wanted:**

- 11.8% of students surveyed said their number one wish list item is a phone.
  - 59% of students who want a phone specified that they wanted an iPhone
  - 85% of students who want a phone attend the Title 1 school, 15% attend the affluent school.
  - It could be assumed that the affluent school students already have phones
- 6.6% of students surveyed said their number one wish list item is a laptop/PC.
  - 86.7% of students who want a laptop/PC attend the Title 1 school, 13.3% attend the affluent school
  - It could be assumed that the affluent school students already have laptops/PC's

# **“What is the number one thing on your wish list and how much do you think it costs?”**

## **A break down of common items wanted (continued)...**

- 9.2% of students surveyed said their number one wish list item is a gaming console (Nintendo Switch/PS4/xBox/Playstation)
  - 90.5% of these students who want a gaming console attend the Title 1 school, 9.5% attend the affluent school
  - It could be assumed that the affluent school students already have gaming consoles
- 4.8% of students surveyed said their number one wish list item is a game for a game console/gift card for a game console
  - 81.8% of these students who want a game/giftcard attend the Title 1 school, 18.2% attend the affluent school
  - It could be assumed that 4.8% of students already have a gaming console



# **“What is the number one thing on your wish list and how much do you think it costs?”**

## **A break down of common items wanted (continued)...**

- 5.7% of students surveyed said their number one wish list item is an Apple product other than an iPhone (iPod, iPad, AirPods, Apple Watch, Apple TV)
  - 69% of these students who want an Apple product other than an iPhone attend the Title 1 school, 31% attend the affluent school
  - It could be assumed that the affluent school students already have Apple products
- 10.9% of students surveyed said their number one wish list item is “nothing” or that they “don’t know”
  - 52% of these students who don’t want anything or don’t know what they want attend the Title 1 school, 48% attend the affluent school
  - It could be assumed that these kids are content with what they have. One Title 1 student even said “Nothing, I am thankful.”

# **“What is the number one thing on your wish list and how much do you think it costs?”**

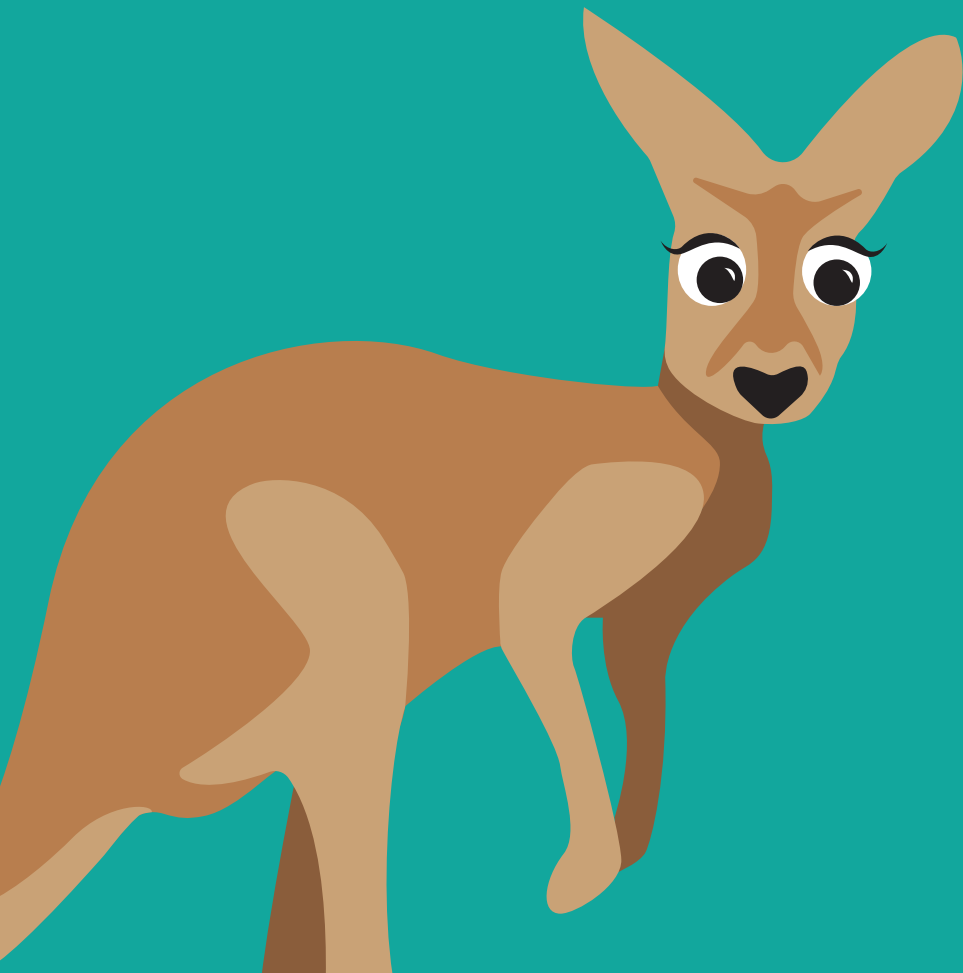
## **A break down of common items wanted (continued)...**

- 2.2% of students surveyed said their number one wish list item is college
  - 60% of these students who want college attend the Title 1 school, 40% attend the affluent school
  - One student from the Title 1 school specified Harvard and knew the exact tuition price

# **“What is the number one thing on your wish list and how much do you think it costs?”**

**These 10 responses stood out because they demonstrate ambition and selflessness...**

- From the Title 1 school:
  1. “I don’t know I am just saving.”
  2. “College, over a thousand dollars”
  3. “I want to help my mother and give her some money and it might cost \$40 thousand”
  4. “Harvard, \$50,000/year”
  5. “College, save all my money”
  6. “I want to buy a car, I really don’t know how much it is going to cost but I at least want to help my mom pay for the car when I become 16.”
  7. “Start my own business, over \$250”
  8. “Nothing, I am thankful.”
  
- From affluent school:
  1. “College, depends but its like 300k”
  2. “Just wait for College”



**So how does  
all of this affect  
the design?**

## Recommendations for fund 2.0

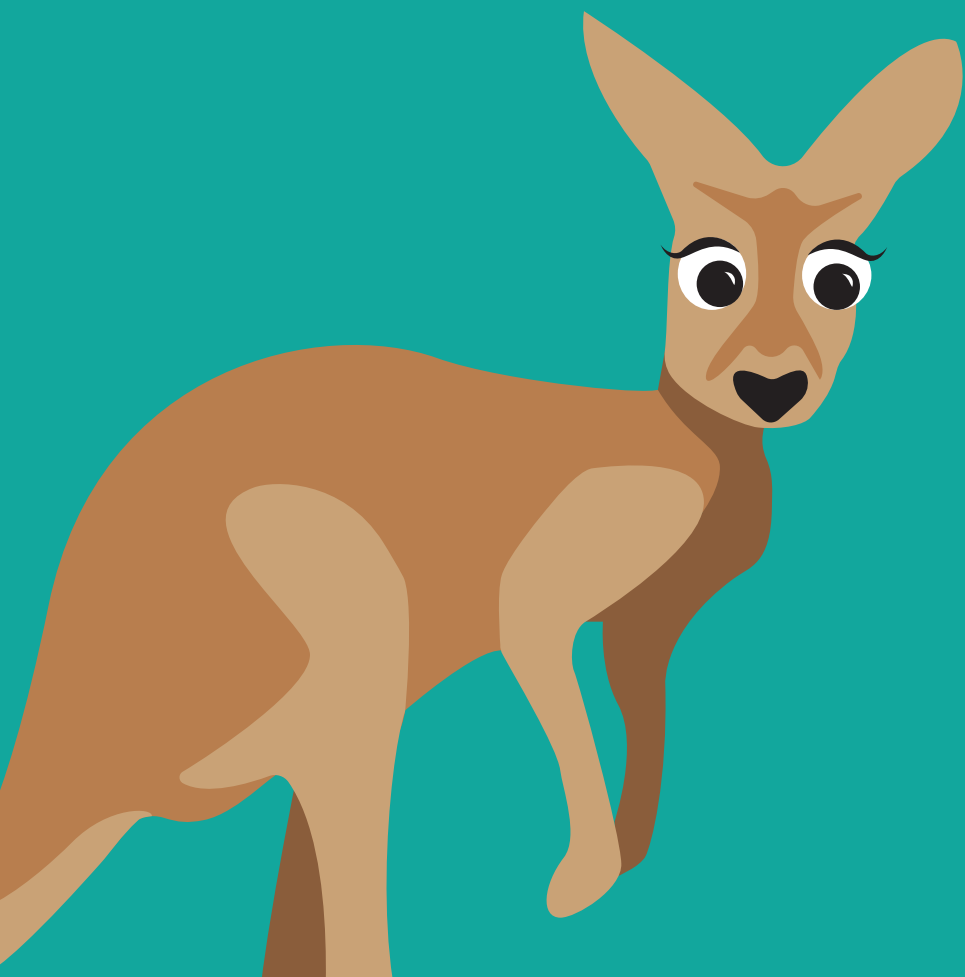
1. Instead of simply asking what the student would like to save for, it should also provide some options to encourage saving for larger, or more important items (such as a laptop or car).
2. There should be some sort of database that students can use to look up prices to ensure they are saving the correct amount because almost 25% of students surveyed did not know the cost of their desired item or guessed completely wrong (meaning their guess was not within 25% of actual price).



## Recommendations for fund 2.0

3. There should be an option to save for an unspecified item, since many students didn't know what they wanted/said "nothing" when asked what the number one thing on their wish list is. The student could still set a goal, without specifying an item, to allow them to save for the sake of saving.
4. There should be an option to save for an unspecified amount. This would be applicable for those who want to save for their parents, since many of these students are selfless and want to help. It would also work for saving for college.





**Thank you!**